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Subslug: [Article by Lieutenant Colonel V. Maksimovskiy: ''A New 'Perpetual' Engine?'']

FULL TEXT OF ARTICLE:

1. [Article by Lieutenant Colonel V. Maksimovskiy: ''A New 'Perpetual' Engine?'']

2. [Text] There are examples in the history of science of revolutionary discoveries by persons working alone which give impetus to a more precise definition of fundamentally new knowledge, the development of directions for application, and the creation of equipment which serves man firsthand. The pace of evolution is gradually declining. But this is where a new fundamental discovery usually follows and the cycle is repeated.

3. In our time, man needs to make use of more and more energy. But in doing this, he ruins his own environment. All the well-known methods of surmounting the crisis that has developed are based on traditional approaches, and taking into account the sluggishness of our consciousness, they may turn out to be insufficiently effective or overdue for that reason. But there are persons capable of getting ''off the beaten path'' and suggesting alternatives which go beyond the limits of established conceptions. The bearers of these ideas are often eminent scientists, and they must have irrefutable arguments to support new theories. The pioneers follow a long and thorny path for this reason. We will acquaint our readers with one of these persons and his ideas.

4. V. Shabetnik, senior scientific associate of the NPO [Scientific Production Association] of Experimental Machine Building and candidate of technical sciences, suggests that airborne vehicles using a unique means of propulsion be built. Craft such as these will not need hydrocarbon fuels.

5. Two 'Whales' [scientific progenitors]

6. Vasiliy Dmitriyevich long ago set himself the task of finding a means of doing without the use of thermal energy in engines by converting the energy from an on-board source directly into performance. The point is that the disorganized thermal movement of molecules in a working fluid cannot be completely regulated by organizing the process of its discharge in rocket or jet engines, and thrust is created in them very inefficiently for this reason. Shabetnik came to the conclusion that Tsiolkovskiy's formula is similar to Boltzmann's formula, which characterizes the entropy of a system and confirms the need for very high expenditures of energy to boost rockets to high speeds. Indeed, the useful load eliminated in low near-earth orbit makes up only 2 to 4 percent of the initial mass of a booster rocket. This conclusion applies to all engines which utilize the energy of discharged masses to create thrust, including plasma, ions, and photons. But if we are referring to manned flights beyond the solar system, when much greater speeds must be reached, there are serious doubts about the possibility of realizing them.

7. First of all, Shabetnik came to the conclusion that the fundamental subatomic particles (electrons, protons, and neutrons), as well as photons, have a structure that is quite specific. This conflicts with the assumptions of quantum physics and the statistical, random concepts of matter. But it was precisely such an approach that made it possible to evaluate the phenomenon of superconductivity in a completely untraditional way and to arrive at the creation of high-temperature superconducting materials. Their use makes it possible to eliminate the losses of electric energy and to develop fundamentally new devices.

8. Second, an innovator had established and explained the phenomenon of energy conversion. Back in 1959, our scientist P. Oshchepkov conducted an experiment: he sent current through a semiconductor and measured the heat release. It turned out that 2.19 times more thermal energy is obtained than if electrical energy is used. At the same time, the phenomenon was not explained. Shabetnik determined the conditions under which several times as much energy is obtained through the internal energy of a substance than is conducted to a device. Thus, he considers a fourfold increase in it to be technologically feasible. And this makes it possible to create an energy generator.

9. 'Muhammad's Coffin'

10. How does Shabetnik visualize the configuration of a spacecraft? In his opinion, a hull spherical in shape is best suited for flights in outer space. It should be covered entirely with a layer of superconductive material (in the jargon of physicists, this is called

''Muhammad's coffin''). No less than three accelerators of high-velocity electrons will be positioned inside the hull, closer to the envelope. The accelerators should have the opportunity to move along the ''equator'' of the spacecraft. One of the atomic reactors which have already operated in space may be used as the on-board source of energy. However, if a generator invented by the author of this suggestion is used, the entire system becomes completely safe and ecologically clean. Only one initial ''charge'' of electricity will be needed from the generator, which will be developing energy by utilizing the effect of energy conversion mentioned and the continuous currents in the semiconductor. With an excess in the amount of energy obtained which is four times the amount consumed and accelerators with KPD [efficiency] equivalent to 30 percent, this generator should produce 20 percent of the energy ''pumped in'' initially.

11. Operation of the System

12. The high-velocity electrons emitted by the accelerators ''fly out'' of the spacecraft along the superconducting envelope and induce an electrical current in it which supplies the generator. The movement takes place through the interaction of this induced current and another current-the flow of those same electrons that were emitted. An ampere force is developed that is proportionate to the product of force from the currents and the area of the semiconductor interacting with the field of electron flow and inversely proportionate to the distance between the currents. This distance is very small, because the electrons are moving along the length of the envelope. So ''Muhammad's coffin'' flies as if it were repelled by the magnetic field created outside the spacecraft by the high-velocity electrons being emitted. The thrust is perpendicular to the direction of their movement. By controlling this movement and increasing the current, the direction and speed of flight may be controlled.

13. The inventor is convinced that such a craft does not constitute a closed system together with the electrons. After all, they are ''ejected'' by the accelerators into the surrounding space, and by creating a magnetic field and inducing current in the superconducting envelope, they do not belong to the spacecraft. That is, in his opinion, this is not a suitable analogy to the story about Munchhausen pulling himself out of a bog by his hair-the laws of physics apply.

14. The Possibilities

15. So the acceleration that such a spacecraft can achieve in space depends on the area of the superconductor's surface and the capacity

of the on-board accelerators (and of course, the external gravitational force of celestial bodies). If it flies at an acceleration equal to that of the earth, the craft will reach a speed close to the speed of light in less than a year. The craft will continue in free flight into the vicinity of the planetary system or star being studied and then it will decelerate. This is how we may travel through the galaxy, resolving the problem of weightlessness for astronauts at the same time.

16. Some readers will think this is another fantasy like the ''perpetual'' engine. This is not surprising-a completely normal reaction. But does the author only have ideas? Of course not! Realizing how difficult it will be to defend his theory and believing it necessary to achieve recognition in scientific circles right away, Vasiliy Dmitriyevich adopted a flexible tactic. He delivered papers at Gagarin and Tsiolkovskiy lectures and certain scientific conferences and filed claims for the invention. By working in a sectorial NPO, he made his work noticed by high scientific officials, and they have not hindered him. Now there are published works, and they are known here and abroad. Now we cannot pretend that there is no theory.

17. What Has Been Done?

18. But how is practice a criterion for truth? And practice already exists. Persons were found at the NPO EM [Experimental Machine Building Scientific Production Association], including managers such as V. Pallo (he is the chairman of the enterprise's Astronautics Federation Committee), who considered it expedient to conduct experiments to verify the new principles that had been set forth. These tests were held in March and May this year. The work was put into the official records of the respected organization and a movie was made. The behavior of models of high-temperature superconducting materials of the Y-Ba-Cu-O type was studied when joined to a hull in which electrodes had been arranged. A pulse (about 7 ns) of electrical current (about 150 amperes) was fed to them, bringing about the flow of electrons. The models were placed in tanks with liquid nitrogen, since the effect of superconductivity appears at that temperature. The last test was most significant: a superconductor 1.7 square centimeters in area developed a force of more than 22.5 grams. It was 1.5 millimeters thick and had a mass of 2 grams.

19. In addition, the high-temperature superconducting material that Shabetnik developed is undergoing an official test.

20. What conclusions have the researchers drawn? First of all, that the principles set forth by the author are correct. Secondly, in the

near future it will be necessary to complete refinement of individual assemblies, conduct a synthesis of new high-temperature superconducting materials, and begin development of an airborne vehicle prototype with a diameter of up to 5 meters and a mass of up to 5 metric tons.

21. The Outlook

22. Many other obstacles have not been surmounted yet, of course, but the matter is worth active study. It is necessary to be convinced once and for all of the validity of this means of propulsion. Our country has indisputable priority here. And if the author is correct in obtaining materials with a superconducting effect at temperatures of over 800 degrees C., such means of transportation may be developed for trips at the earth's surface: not only instead of motor vehicles, locomotives, and diesel vessels, but airplanes as well. New booster rockets may make their appearance. There will be advanced, ecologically clean means of transportation. But for the present, the manufacture of spacecraft is the most practicable. Aside from other advantages, if these craft are spherical in shape, they are protected by their field from most meterorites.

23. It is interesting that models in the experiment moved like **''flying saucers.''** Movements and changes in direction were instantaneous. Who knows, perhaps V. Shabetnik has unraveled their secret (if one exists). But this is not important if such devices make their appearance. We ourselves may become inhabitants of another planet to someone else, and our earth will become cleaner and more suitable for human life. Why hurry to migrate to other planets and space stations? After all, the sun will be shining for everyone even longer!

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